THE EFFECT OF SULPHUR AND BORON ON THE GROWTH AND YIELD OF RAPESEED

W.F. Nuttall, Melfort Research Station, D. Maynard and J. Stewart, Department of Soil Science, H. Ukrainetz, Saskatoon Research Station

Sulphur and boron are essential elements for the growth of crops. Sulphur is particularly important for the growth of legumes and rapeseed. In recent years, a problem has appeared in rape fields of northeastern Saskatchewan where areas within fields and in some cases whole fields did not produce pods. In most instances the problem occurred on Gray wooded soils (Waitville loam, Sylvania fine sandy loam) containing low levels of available sulphur.

A greenhouse experiment showed that the problem of no pod formation could be corrected with boron or a combination of nitrogen, phosphorus and sulphur. Greenhouse results on another soil type (Sylvania fine sandy loam) showed that the combination of nitrogen, phosphorus and sulphur did not correct this deficiency. However, in a field trial on this particular soil, sulphur fertilizer applied to rape crops increased crop growth and the formation of pods. (Tables 1 and 2)

Table 1. Syfl Gronlid - 1979
Effect of NPKSB Nutrients
on Yield of Rapeseed

Code	Cultivar*	Nutrients** NPK	NPKS	NPKSB
		Yield in KG/HA		
1	Candle	122	634	288
2	Torch	285	909	570
3	Tower	53	695	673
4	Midas	154	722	836
5	Regent	44	758	704

**F Test Highly Significant (1%)
N = 100 KG N/HA
P = 20 KG P/HA (45 KG P_2O_5/HA)
K = 50 KG K/HA
S = 25 KG S/HA
B = 2.8 KG B/HA

*F Test Significant (5%)

Table 2. Wvl Valparaiso
Effect of NPKSB Nutrients
on Yield of Rapeseed

Code	Cultivar**	Nutrients** NPK	NPKS	NPKSB
		Yield in KG/HA		
1	Candle	256	353	458
2	Torch	295	797	414
3	Tower	61	701	678
4	Midas	221	500	878
5	Regent	57	627	567
			1.4 KG B/HA = 775	

**Nutrients and Nutr. X Cult.

F Test was Highly Significant (1%)

N = 100 KG N/HA, P = 20 KG P/HA, K = 50 KG K/HA,

S = 25 KG S/HA, B = 2.8 KG B/HA

Addition of boron appeared to improve pod growth and produced pods which did not shatter as readily as when sulphur alone was applied.

From these experiments tentative conclusions have been drawn:

(1) Application of sulphate-sulphur fertilizer will correct the problem of no pod formation on rape plants.

(2) Addition of elemental sulphur (not sulphate) in the spring of the year will not correct the deficiency. Elemental S should be applied the summer before.

(3) Adding boron produced pods which did not shatter as soon as when sulphur was applied alone. Improved pod growth was observed on boron treated rape plants. Midas rape appeared to respond to the B treatment at both sites.

(4) Some soils considered deficient in sulphur, produced rape plants with normal pod formation without the addition of S fertilizer, despite the fact that sulphur fertilizer increased yields on these soils.

(5) The number of plants per plot was related to yield of rape at the Waitville loam site (Valparaiso).

Further field trials will be conducted to determine yield response to sulphur and boron under different weather conditions. Also, other crops need to be tested on these deficient soils to determine possible yield response to micro-nutrient elements.

Table 3. Syfl Gronlid - 1979
Emergence of Cultivars
Fertilized with NPKSB

Code	Cultivar**	Treatment† NPK	NPKS	NPKSB	Mean
			Percent Emergence		
1	Candle	16.3	13.7	9.8	13.3
2	Torch	22.7	30.6	15.3	22.9
3	Tower	11.2	13.7	9.9	11.6
4	Midas	11.5	14.3	12.6	12.8

**F Test Significant at 1% Probability Level

†Almost Significant at 5%

Table 4. Wvl Valparaiso - 1979
Emergence of Cultivars
Fertilized with NPKSB

Code	Cultivar*	Treatment* NPK	NPKS	NPKSB	Mean
			Percent Emergence		
1	Candle	3.5	2.8	4.7	3.7
2	Torch	7.3	5.0	2.6	5.0
3	Tower	3.0	5.6	4.6	4.4
4	Midas	3.2	3.7	6.1	4.3

*CxT Interaction Significant at 5%